ATTACHMENT H

STORAGE TANK SYSTEM

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

LIST OF SUPPLEMENTS

LIST OF ABBREVIATIONS/ACRONYMS

20.4.1 NMAC	New Mexico Administrative Code, Title 20, Chapter 4, Part 1
ACI	American Concrete Institute
ASME	American Society of Mechanical Engineers
ASTM	American Society for Testing and Materials
BPVC	Boiler and Pressure Vessel Code
CAM	continuous air monitor
ft	feet/foot
gal	gallon(s)
in.	inch(es)
L	liter(s)
LANL	Los Alamos National Laboratory
TA	technical area

ATTACHMENT H
STORAGE TANK SYSTEM

The information provided in this section is submitted to address the applicable tank system requirements of the New Mexico Administrative Code, Title 20, Chapter 4, Part 1 (20.4.1 NMAC) §270.16, and 20.4.1 NMAC, Subpart V, Part 264, Subpart J, revised June 14, 2000 [6-14-00]. This section provides a description of the storage tank system that is used to store mixed waste solutions at Los Alamos National Laboratory (LANL) Technical Area (TA) 55. It includes detailed descriptions of the storage tank system components and associated ancillary equipment.

There is one storage tank system at TA-55 that is comprised of 3 tank components that share a common piping and pumping system. The storage tank system consists of both new and existing components as summarized in Table H-1.

The evaporator glovebox tank was constructed in 1986 and is an existing tank; therefore, this component of the tank system is addressed in this permit application in accordance with the requirements of 20.4.1 NMAC §264.191 [6-14-00]. The cementation unit pencil tanks were constructed in 1985 and were considered existing tanks until new components were installed in 1996. These new components were determined to be a major, non-routine modification; therefore, the cementation unit pencil tanks are subject to the new tank system regulations and are addressed in this permit application as new tanks in accordance with the requirements of 20.4.1 NMAC §264.192 [6-14-00]. The pencil tanks will be constructed and, thus, are subject to new tank system regulations in accordance with the requirements of 20.4.1 NMAC §264.192 [6-14-00].

The written engineering assessments and certifications for the tanks, as required by 20.4.1 NMAC §§264.191 and 264.192(a) [6-14-00], are provided in Supplements H.1, H.2A, H.2B, H.2C, and H.3, respectively. Detailed drawings and information are provided as Figures H-1 through H-13 and are provided for informational purposes only. Table H-2 summarizes applicable regulatory references for tank systems and the corresponding location where the requirement is addressed in this permit renewal application.

H.1 DESIGN, CONSTRUCTION, MATERIALS, AND OPERATION [20.4.1 NMAC §270.16(b), (c), (d) and (I); 20.4.1 NMAC §§264.191(b)(1) and (3), and 264.192(a)(1)]

The TA-55 storage tank system is located at TA-55, Building 4, in Room 401 (Figure H-1) and has a maximum capacity of 1,270 Liters (L) (336 gallons [gal]). The storage tank system consists of 3 components, with 16 tanks, that are used to store evaporator bottoms solutions prior to stabilization in the cementation unit.

The evaporator bottoms solutions are initially stored in the evaporator glovebox tank component, where they are sampled for radionuclides, oxides, and metals. They remain in the evaporator glovebox tank component until the radionuclide content is known. If the sampling results show radionuclide concentrations below the discard limit, the solutions are transferred to the cementation unit pencil tanks component or the pencil tanks component for storage pending the remaining analytical results. Upon completion of the remaining analyses, the solutions are transferred directly to the cementation unit for treatment. If the sampling results show concentrations above the discard limit, the solutions are recirculated. Figures H-1 and H-2 provide a general arrangement diagram and a process flow diagram for the TA-55 storage tank system.

The storage tank system is connected to three main piping systems, which include the solution feed, ventilation, and vacuum piping systems. Each tank component has a separate header that connects to each of the piping systems. The wet-vacuum piping system is used for all transfers; and the vent-piping system is used to break vacuum. The wet-vacuum and vent-piping systems use vacuum traps to capture carryover liquid and prevent contamination of the lines downstream. One vacuum pump serves the storage tank system for liquid transfers and for vacuum sparging. The following sections provide descriptions of each of the tank system components and associated ancillary equipment. The information meets the requirements of 20.4.1 NMAC §270.16(b), (c), (d) and (I); 20.4.1 NMAC §§264.191(b)(1) and (3); and 264.192(a)(1) [6-14-00].

H.1.1 Evaporator Glovebox Tank Component

The evaporator glovebox tank component is located in the northwest corner of TA-55-4, Room 401, as shown in Figure H-1. It is approximately 8 feet (ft) high, 4-ft wide, and 13-ft long and consists of two welded-steel trays, eight glass columns, and associated ancillary equipment. The overall capacity of the evaporator glovebox tank component is approximately 270 L (71 gal). The evaporator glovebox tank component is fabricated from 0.1875-inch (in.), 316 stainless steel with a 2B finish conforming to the American Society for Testing and Materials (ASTM) “A240-Standard Specification for Heat-

Resisting Chromium and Chromium-Nickel Stainless Steel Plate, Sheet and Strip for Pressure Vessels," hereinafter referred to as ASTM A240 (ASTM, 1998). The lower half of the tank is fabricated with additional layers of materials welded to the outside of the 0.1875-in.-thick stainless-steel enclosure. These materials consist of 0.25-in.-thick lead shielding, conforming to ASTM "B29-Standard Specification for Refined Lead" (ASTM, 1997a), and an outer layer of 0.0625-in. 316 stainless steel cladding. The tank component is of welded construction with all welds blended, ground, and polished to blend with adjacent material. All joints are vacuum tight.

The support frame and legs of the evaporator glovebox tank component are constructed of carbon steel and conform to ASTM "A36-Standard Specification for Structural Steel for Welding" (ASTM, 1987). The support frame is bolted to the base of the tank component for stabilization. In addition, the legs of the tank component are bolted to the support frame and secured to the 10-in.-thick concrete floor of Room 401 with anchor bolts. The 10-in.-thick concrete floor was constructed to conform to the reinforced concrete building code requirements of the American Concrete Institute (ACI) "318-71-Building Code Requirements for Structural Concrete and Commentary," hereinafter referred to as ACI 318-71 (ACI, 1995). The reinforcing steel was detailed and fabricated in accordance with ACI "315-Details and Detailing of Concrete Reinforcement," hereinafter referred to as ACI 315 (ACI, 1992). The design construction and tolerance of the framework around the concrete is in accordance with ACI "347-Guide to Formwork for Concrete," hereinafter referred to as ACI 347 (ACI, 1994). Figure H-3 shows the dimensions of the evaporator glovebox tank component and its support structure.

The window portions of the evaporator glovebox tank component are constructed of 0.25-in. leaded glass, laminated on both sides with 0.125-in. clear glass, and installed with a neoprene gasket. Additionally, each window is backed with 0.25-in. safety glass installed with a neoprene gasket/seal that provides airtight containment. The dual glass configuration is secured to the tank component with a welded frame consisting of a 0.25-in.-thick lead shielding and a 0.0625-in. 316 stainless steel cladding similar to the additional layers of materials welded to the outside of the lower half of the tank component. The welded window frames are bolted to the tank component. Replacement windows and gaskets, if and when needed, will be made of the same or similar materials.

The glove portions of the evaporator glovebox tank component are constructed of neoprene and Hypalon®. Each glove is tested for material continuity by the manufacturer before acceptance and installation in the evaporator glovebox tank component. Each glove is selected for its resistance to nitric acid. Replacement gloves, when needed, will be made of the same or similar materials.

The evaporator bottoms solutions are vacuum-transferred from the steel trays to the glass columns. Each glass column is individually filled and visually monitored during transfer from the steel trays to a glass column. To prevent overfill, the evaporator bottoms are automatically directed to a vacuum trap when the maximum capacity of a column is reached. The maximum capacity of the vacuum trap is approximately 5.5 L. The glass columns and the vacuum trap are constructed of PYREX® glass, manufactured by Corning, with stainless steel end plates. Replacement parts for the columns and vacuum trap will be of the same or similar materials. The glass columns are equipped with an air-sparging system designed to homogeneously mix the evaporator bottoms prior to sampling or transfer.

The piping associated with the evaporator glovebox tank component includes the transfer line from the evaporator, the wet-vacuum line, the lean-residue transfer line, and the ventilation lines entering and exiting the evaporator glovebox tank component. Figures H-4 and H-5 provide a legend and a piping and instrumentation diagram for the evaporator glovebox tank component. All piping and associated valves are constructed of single-walled, 316 stainless steel. The transfer line from the evaporator is 1.0-in. pipe, the wet-vacuum line and the lean-residue transfer line are 0.75-in. pipe, and the ventilation lines are 2.0-in. pipe. Pipe diameters may change in the event that a portion of the piping requires replacement. The evaporator glovebox tank component's ancillary equipment is supported by a steel channel Uni-strut® support frame. The Uni-strut® support frame is secured to the concrete ceiling with anchor bolts and provides the component's ancillary equipment with support and protection against physical damage and excessive stress that could potentially result from settlement, vibration, expansion, or contraction. Replacement supports will be made of the same or similar materials.

The evaporator glovebox tank component does not operate under pressure; therefore, excessive stress due to expansion and contraction is not anticipated. The evaporation glovebox component is not located within a saturated zone or seismic fault zone; therefore, floatation or dislodgment is unlikely. The component is located within a building, so frost effects are not expected.

All of the materials within the evaporator glovebox tank component are corrosion-resistant and are compatible with the evaporator bottoms stored in the tank component. No external portions of the tank component are in contact with soil or water.

H.1.2 Cementation Unit Pencil Tanks Component

The cementation unit pencil tanks component consists of five vertical tanks located perpendicular to the west wall of TA-55-4 in Room 401, as shown on Figure H-1. Each of the pencil tanks has a working capacity of 50 L (13 gal), an outside diameter of 6.625 in., a straight side height of 10 ft, a wall thickness of 0.28 in., and a conical bottom, as shown on Figure H-6. The pencil tanks are constructed of 316 stainless steel. The stainless steel materials are corrosion-resistant and are compatible with the liquid waste stored in the tanks, as confirmed by corrosion testing conducted in 1993 by TA-55 facility engineers. The vent trap and the vacuum trap operating within the cementation unit pencil tanks component have an outside diameter of 6.625 in. The vent trap has a straight side height of 9 in. and a maximum capacity of approximately 4 L. The vacuum trap has a straight side height of 37 in., a conical bottom, and a maximum capacity of approximately 17 L. The vent trap and the vacuum trap are constructed of 316 stainless steel for corrosion resistance and materials compatibility with the waste. All of the pencil tanks were designed in accordance with the latest applicable standards, including American Society of Mechanical Engineers (ASME) “Boiler and Pressure Vessel Code” (BPVC) (ASME, 1998), hereinafter referred to as ASME BPVC, Section VIII, Division 1. The pencil tanks are installed such that, if necessary, they can be replaced.

H.1.2.1 Piping and Ancillary Equipment

The piping associated with the cementation unit pencil tanks component includes the header/manifold, vacuum manifold, and lower manifold for the cementation unit pencil tanks component; the vent trap, vent line, and drain line; the transfer line from the evaporator glovebox tank component to the cementation unit pencil tanks component header/manifold; and the transfer line from the lower manifold to the cementation unit. Figures H-4 and H-7 provide a legend and piping and instrumentation diagram for the cementation unit pencil tanks component. All intertank piping and transfer piping is single-walled 0.75-in., Schedule 40, stainless steel pipe. Pipe diameters may change in the event that a portion of the piping requires replacement. All tank-to-piping connections are flanged.

The cementation unit pencil tanks component is equipped with a vacuum trap that is designed to collect any mists or carryover liquid that might accumulate in the vacuum or vent lines. The vacuum trap is equipped with a sight glass for local level indication and is normally empty. Each cementation unit pencil tank is equipped with three sight glasses located on the side of each tank for overfill protection.

H.1.2.2 Foundation and Support

The cementation unit pencil tanks component is erected upon a 10-in.-thick concrete floor in TA-55-4, Room 401. The 10-in.-thick concrete floor provides a foundation that will maintain the load of the tank component when full. The concrete floor and ceiling were constructed to conform to the building code requirements of ACI 318-71 for reinforced concrete (ACI, 1995). The reinforcing steel was detailed and fabricated in accordance with ACI 315 (ACI, 1992). The design, construction and tolerance of the framework around the concrete is in accordance with ACI 347 (ACI, 1994). The cementation unit pencil tanks component and its ancillary equipment are elevated and supported by a steel channel, Uni-strut® support frame. The Uni-strut® support frame is secured to the concrete floor with anchor bolts and provides the ancillary equipment with support and protection against physical damage and excessive stress due to settlement and vibration.

The cementation unit pencil tanks component does not operate under pressure; therefore, physical damage and excessive stress due to expansion and contraction is not anticipated. Furthermore, the cementation unit pencil tanks component is not within a saturated zone or seismic fault zone; therefore, flotation or dislodgment is not likely. The component is located within a building, so frost heave effects are not expected.

H.1.3 Pencil Tanks Component

The following information for the pencil tanks component is based upon a completed drawing package prepared by Johnson Controls of Northern New Mexico, dated July 2001. The pencil tanks component will consist of ten vertical tanks located perpendicular to the west wall of TA-55-4, Room 401, as shown on Figure H-1. Each pencil tank will have a capacity of 50 L (13 gal), a 6.625-in. outer diameter, a straight side height of 10 ft, a wall thickness of 0.28 in., and a conical bottom, as shown on Figure H-8. The pencil tanks will be constructed of seamless Schedule 40, 316 stainless steel pipe. These materials meet the chemical and physical characteristics given in ASTM “A312-Standard Specification for Seamless and Welded Austenitic Stainless Steel Pipes,” hereinafter referred to as ASTM A312 (ASTM, 1995). The tanks will be corrosion-resistant and compatible with the liquid waste to be stored in them. Each tank will be equipped with three sight glasses for local level indication and will have a high-level switch for prevention of spills or overfilling. The primary containment welds for each tank will be vacuum tight in accordance with the ASME BPVC Section VIII, Division 1, Subsection B, Part UW (ASME, 1998). All penetrations into the shells of the tanks will be designed and fabricated to ensure vacuum tightness and will comply with ASME BPVC Section VIII, Division 1 (ASME, 1998). However, an ASME stamp will not be required for the pencil tanks component because they will not be

operated as pressure vessels. Each pencil tank will be installed such that, if necessary, they can be replaced.

H.1.3.1 Piping and Ancillary Equipment

The pencil tanks component will be connected to system headers (for feed, ventilation, and vacuum) by a manifold that will be constructed of seamless stainless steel and that meets the chemical and physical characteristics given in ASTM A312 (ASTM, 1995). Figure H-9 provides a piping and instrumentation diagram for the pencil tanks component. The piping will be connected to the existing tank system intertank and transfer piping of 0.75 in., Schedule 40 pipe. It will meet the requirements of ASME "B31.3-Process Piping," hereinafter referred to as ASME B31.3 (ASME, 1996a), for normal fluid service, with a maximum design pressure of 15 pounds per square inch and design temperature of 10 degrees Fahrenheit. All piping connections will be via flanged and gasketed connections and will be provided in accordance with ASME "B16.5-Pipe Flanges and Flanged Fittings," hereinafter referred to as ASME B16.5 (ASME, 1996b). The flanges will be forged from stainless steel and will meet the Grade F316L requirements of ASTM "A182-Standard Specification for Forged or Rolled Alloy-Steel Pipe Flanges, Forged Fittings and Valves, and Parts for High-Temperature Service," hereinafter referred to as ASTM A182 (ASTM, 1997b).

The pencil tanks component will be equipped with a vacuum trap that will be designed to collect any mists or carryover liquid that might accumulate in the vacuum or vent lines. The vacuum trap will be constructed of 6.25-in. outer diameter, Schedule 40, 316 seamless stainless steel. The vacuum trap will be equipped with a sight glass for local level indication will have a high-level switch for prevention of spills or overflowing and will normally be empty.

H.1.3.2 Foundation and Tank Support

The pencil tanks component and associated ancillary equipment will be integrated within a support stand assembly. The support stand assembly will be approximately 3-ft, 10-in. wide by 7-ft, 8-in. long, as shown on Figures H-10 and H-11, and will be bolted to the 10-in.-thick concrete floor of TA-55-4, Room 401. The floor provides a foundation that will maintain the load of the pencil tanks component when full. The concrete floor and ceiling were constructed to conform to the building code requirements of ACI 318-71 for reinforced concrete (ACI, 1995). The reinforcing steel was detailed and fabricated in accordance with ACI 315 (ACI, 1992). The design construction and tolerance of the framework around the concrete is in accordance with ACI 347 (ACI, 1994).

The support stand assembly superstructure will consist of braced frames that extend approximately 9 ft, 11 in. from the floor. The superstructure will be fabricated entirely from carbon steel. Connections will be welded, except where bolting is required for erection of subassemblies within Room 401. All carbon steel used for the superstructure will be painted in accordance with the Steel Structures Painting Council with a high build-up epoxy primer and finish coat.

The pencil tanks component will not operate under pressure; therefore, excessive stress due to expansion and contraction is not anticipated. The pencil tanks component will not be located within a saturated zone or seismic fault zone; therefore, floatation or dislodgment is unlikely. The component will be located within a building, so frost heave effects are not expected.

H.2 INSTALLATION, TESTING, AND CERTIFICATION [20.4.1 NMAC §270.16(a) and (f); 20.4.1 NMAC §264.191(b); §264.192(a),(b), and (d); and §264.193(I)]

H.2.1 Evaporator Glovebox Tank Component

The evaporator glovebox tank component is considered an existing tank component in accordance with 20.4.1 NMAC §264.191 [6-14-00], and has secondary containment that meets the requirements of 20.4.1 NMAC §264.193 [6-14-00]. Therefore, pursuant to 20.4.1 NMAC §264.191(a) [6-14-00], the requirement that the owner or operator of the tank determine that the tank is not leaking or is unfit for use is not applicable. In addition, the requirement that the owner or operator obtain and keep on file a written assessment attesting to the tank's integrity is also not applicable. However, for the purpose of demonstrating that the evaporator glovebox tank component will function as a completely leak-proof system and would meet the assessment requirements if they were applicable, a written assessment has been prepared in accordance with 20.4.1 NMAC §264.191(b), and 20.4.1 NMAC §270.16(a) [6-14-00], attesting that the tank component is adequately designed and has sufficient structural integrity and compatibility with the waste stored to ensure that it will not collapse, rupture, or fail. The written assessment, reviewed and certified by an independent, qualified, registered professional engineer, is included as Supplement H.1 of this permit application.

A helium leak-test using a mass spectrometer was performed on the evaporator glovebox tank component upon fabrication at Silver Engineering and again after it was installed and made operational at its present location in TA-55-4, Room 401. Because secondary containment (see Section H.3) is provided for this tank, the requirements in 20.4.1 NMAC §264.193(i) [6-14-00], are not applicable.

H.2.2 Cementation Unit Pencil Tanks Component

In accordance with 20.4.1 NMAC §264.192(a) [6-14-00], a written assessment has been prepared attesting that the cementation unit pencil tanks component has sufficient structural integrity and is acceptable for handling mixed waste. The written assessment, reviewed and certified by an independent, qualified, registered professional engineer, is included as Supplement H.2A of this permit application.

In accordance with 20.4.1 NMAC §264.192(d) [6-14-00], owners or operators of new tanks and ancillary equipment must ensure that the system is tested for tightness. The cementation unit pencil tanks component was tightness tested on May 30, 1996, at operating pressure (i.e., under a vacuum of 10 to 20 in. of mercury) and determined to be tight. The signed certification attesting to the tank's tightness, the detailed tightness-testing procedure adhered to during the tightness tests, and the results of the tightness tests are included as Supplement H.2B of this permit application.

In accordance with 20.4.1 NMAC §264.192(b) [6-14-00], owners or operators of new tank systems or tank components must ensure that proper handling procedures are adhered to during installation in order to prevent damage to the system. The new portions of this component (i.e., the transfer line from the evaporator glovebox tank component to the cementation unit pencil tanks component header/manifold and the cementation unit header/manifold) have been inspected by a qualified inspector for weld breaks, punctures, scrapes of protective coatings, cracks, corrosion, and other structural damage or inadequate construction or installation. The signed certification attesting to the proper installation of the new components and a copy of the inspection checklist is included as Supplement H.2C of this permit application. Secondary containment (see Section H.3) for the cementation unit pencil tanks component is provided by Room 401; therefore, the requirements in 20.4.1 NMAC §264.193(i) [6-14-00], are not applicable.

H.2.3 Pencil Tanks Component

In accordance with 20.4.1 NMAC §264.192(a) [6-14-00], a written assessment has been prepared attesting that the pencil tanks component is designed to have sufficient structural integrity and is acceptable for handling mixed waste. The written assessment, reviewed and certified by an independent, qualified, registered professional engineer, is included as Supplement H.3 of this permit application.

In accordance with 20.4.1 NMAC §264.192(d) [6-14-00], owners or operators of new tanks and ancillary equipment must ensure that the system is tested for tightness. The pencil tanks component

will be tightness tested at operating pressure (i.e., under a vacuum of 10 to 20 in. of mercury) upon completion of installation and prior to use. A signed certification will be prepared and will include the tightness-testing procedures adhered to during the tightness tests and the results of the tightness tests.

In accordance with 20.4.1 NMAC §264.192(b) [6-14-00], owners or operators of new tank systems or components must ensure that proper handling procedures are adhered to during installation in order to prevent damage to the system. To ensure proper installation, the pencil tanks component and ancillary equipment (i.e., transfer piping, manifolds) will be inspected by a qualified inspector for weld breaks, punctures, scratches in the protective coatings, cracks, corrosion, and other structural damage or inadequate construction or installation. A signed certification attesting to the proper installation of the pencil tanks component and a copy of the inspection checklist will be prepared. Secondary containment (see Section H.3) for the pencil tanks component will be provided by Room 401; therefore, the requirements in 20.4.1 NMAC §264.193(i) [6-14-00], are not applicable.

H.3 SECONDARY CONTAINMENT [20.4.1 NMAC §270.16(g), 20.4.1 NMAC §264.193]

The following provides a detailed description of the secondary containment provided for the storage tank system in accordance with 20.4.1 NMAC §270.16(g), and 20.4.1 NMAC §264.193(a), (b), (c), (d), and (e)(1) [6-14-00]. The storage tank system is located at TA-55-4, inside Room 401. This room has a floor and walls that completely surround the tank system and serve as secondary containment, therefore, the secondary containment meets the requirements of 20.4.1 NMAC §264.193(1)(iv) for an external liner system. The walls and floor of Room 401 will prevent the migration of wastes or accumulated liquids to any soil, groundwater, or surface water and are capable of collecting releases and accumulated liquids until the material is removed. Because the storage tank system and secondary containment are inside a building, run-on or precipitation will not affect the containment capacity. The capacity of the containment area is sufficient to contain 100 percent of the capacity of the largest liquid-bearing tank within its boundary. The secondary containment capacity for the storage tank system is identified in Table H-3.

The floor of Room 401 consists of 10-in.-thick reinforced concrete slab that is compatible with the wastes stored in the storage tank system and will effectively prevent migration of waste. The concrete in Room 401 is sealed with an epoxy or similar coating to aid in decontamination should a spill occur. In addition, tertiary containment is provided by the floor of the basement level of TA-55-4, which also

consists of 10 in. of concrete. The construction joints in the floor slab and exterior walls are all constructed with chemical-resistant water stops in place. The conduit piping penetrating the floor of the room is secured with rubber boots, bushings, and flanges. All penetrations (i.e., holes for conduit) in the floor have been sealed to prevent liquids from entering the penetrations. Figures H-12 and H-13 provide structural drawings illustrating the first floor construction and the locations of floor penetrations.

The storage tank system components and the secondary containment will be inspected daily (during operation) to detect leaks, in accordance with 20.4.1 NMAC §264.195(b) [6-14-00]. Additional leak detection will be provided by continuous air monitors (CAM) at various locations throughout Room 401. CAMs will detect any airborne alpha contamination that would be present if a leak were to occur at any point in the system. Additionally, radiological control technicians periodically monitor for radioactive contamination and would detect any leaks during monitoring. Leaks or spills would be detected within 24 hours, as required by 20.4.1 NMAC §264.193(c)(3) [6-14-00]. The secondary containment will be operated to remove leaks and spills. In the event of a leak or spill into the secondary containment system, the liquids will be removed as quickly as possible with sorbents or vacuum-transferred, using the existing wet vacuum, into an available storage tank component. The collected materials will then be sampled as necessary. If the accumulated liquids are from an identifiable source, the resulting material can be characterized as a newly-generated waste using acceptable knowledge or may be analyzed, as applicable, for the hazardous waste constituents known to be components of the source. If the accumulated liquids are from other than an identifiable source, the resulting material will be analyzed for the appropriate potential parameters listed in Table E-3 of Appendix E in the most recent version of the "Los Alamos National Laboratory General Part B Permit Application." Containers of collected liquids will be stored with secondary containment, pending analytical results, which determine how the waste liquids will be managed. This method of removal and analysis of accumulated liquids fulfills the requirements of 20.4.1 NMAC §270.15(a)(5) [6-14-00], for responses to leaks or spills.

If it is determined that there has been a leak or spill from any of the storage tank components into the secondary containment, all free liquids will be removed within 24 hours unless "as low as reasonably achievable" concerns prevent accessibility. The affected component or portion thereof will be removed from service immediately and the requirements of 20.4.1 NMAC §264.196 [6-14-00], will be initiated.

H.4 SPECIAL REQUIREMENTS FOR IGNITABLE, REACTIVE, AND INCOMPATIBLE WASTES [20.4.1 NMAC §270.16 (j); 20.4.1 NMAC §§264.17, 264.198, and 264.199(a)]

No ignitable, reactive, or incompatible mixed wastes will be stored in the storage tank system.

H.5 AIR EMISSION STANDARDS FOR EQUIPMENT LEAKS [20.4.1 NMAC §264.1064(k), and 20.4.1 NMAC, Subpart V, Part 264, Subpart BB]

The storage tank system is not subject to 20.4.1 NMAC, Subpart V, Part 264, Subpart BB [6-14-00], "Air Emission Standards for Equipment Leaks," with the exception of the reporting requirements specified in 20.4.1 NMAC §264.1064(k) [6-14-00]. None of the components or ancillary equipment associated with the storage tank system will contain or contact mixed waste with organic concentrations of at least 10 percent by weight.

In accordance with 20.4.1 NMAC §264.1064(k) [6-14-00], TA-55 personnel will use knowledge of the nature of the mixed waste stream(s) or knowledge of the process by which the mixed waste was produced to document exemptions to these standards. Production process information documenting that no organic compounds are contained or contacted by the components and ancillary equipment associated with the storage tank system will be recorded in TA-55's facility operating record.

A new determination will be made whenever there is a change in a process at TA-55 that produces mixed waste that could result in an increase in the total organic content of waste contained in or contacted by equipment currently determined not to be subject to these requirements.

H.6 ORGANIC AIR EMISSION STANDARDS [20.4.1 NMAC, Subpart V, Part 264, Subpart CC]

Tanks which store only mixed waste are not subject to the requirements of 20.4.1 NMAC, Subpart V, Part 264, Subpart CC [6-14-00], "Air Emission Standards for Tanks, Surface Impoundments, and Containers." Only mixed waste will be managed in the storage tank system; therefore, the storage tank system is not subject to 20.4.1 NMAC, Subpart V, Part 264, Subpart CC [6-14-00].

H.7 REFERENCES

ACI, 1995 and all approved updates, "318-71-Building Code Requirements for Structural Concrete and Commentary," American Concrete Institute, Detroit, Michigan.

ACI, 1994 and all approved updates, "347-Guide to Formwork for Concrete," American Concrete Institute, Detroit, Michigan.

ACI, 1992 and all approved updates, "315-Details and Detailing of Concrete Reinforcement," American Concrete Institute, Detroit, Michigan.

ASME, 1998 and all approved updates, "Boiler and Pressure Vessel Codes, Section VIII," American Society of Mechanical Engineers, New York, New York.

ASME, 1996a and all approved updates, “B31.3-Process Piping,” American Society of Mechanical Engineers, New York, New York.

ASME, 1996b and all approved updates, “B16.5-Pipe Flanges and Flanged Fittings,” American Society of Mechanical Engineers, New York, New York.

ASTM, 1998 and all approved updates, “A240-Standard Specification for Heat-Resisting Chromium and Chromium-Nickel Stainless Steel Plate, Sheet and Strip for Pressure Vessels,“ American Society for Testing and Materials, Philadelphia, Pennsylvania.

ASTM, 1997a and all approved updates, “B29-Standard Specification for Refined Lead,” American Society for Testing and Materials, Philadelphia, Pennsylvania.

ASTM, 1997b and all approved updates, “A182-Standard Specification for Forged or Rolled Alloy-Steel Pipe Flanges, Forged Fittings and Valves, and Parts for High-Temperature Service,” American Society for Testing and Materials, Philadelphia, Pennsylvania.

ASTM, 1995 and all approved updates, “A312-Standard Specification for Seamless and Welded Austentic Stainless Steel Pipes,” American Society for Testing and Materials, Philadelphia, Pennsylvania.

ASTM, 1987 and all approved updates, “A36-Standard Specification for Structural Steel for Welding,” American Society for Testing and Materials, Philadelphia, Pennsylvania.

Table H-1
Storage Tank System Components at Technical Area 55[a]

Tank Component	Location	Number of Tanks	Tank Capacity[b] (liters)	Tank Capacity[b] (gallons)	Tank Component Status
Evaporator Glovebox Tank	TA-55-4, Room 401	1	270	71	Constructed in 1986. Existing tank component.
Cementation Unit Pencil Tanks	TA-55-4, Room 401	5	50	13	Constructed in 1985. New tank component due to an equipment modification in 1996.
Pencil Tanks	TA-55-4, Room 401	10	50	13	To be constructed. New tank component.

a The storage tank system consists of 3 components that store the same waste matrix and share a common piping network. The overall capacity of the unit is 1,020 liters [~266 gallons].
b The tank capacity listed is for each individual tank associated with the component.

TA = technical area

Table H-2
Tank System Regulatory References and Corresponding Permit Application Location

Regulatory Citation(s)	Description of Requirement	Location in this Permit Application
§270.16	Information requirements for tank systems	Attachment H
§264.13	General waste analysis	Attachment B[a]
§264.191	Assessment of existing tank system's integrity	H.1.1, H.2.1
§270.16	Tank systems	Attachment H
§270.16(a)	Written assessment and certification	Supplements H.1, H.2A, H.2B, H.2C, and H.3
§270.16(b)	Dimensions and capacity	H.1
§270.16(c)	Feed systems, safety cutoff, bypass systems, and pressure controls	H.1
§270.16(d)	Piping, instrumentation, and process flow diagrams	Attachment H
§270.16(e)	External corrosion protection	Supplements H.1, H.2A, H.3, and H.4
§270.16(f)	Installation of new tank systems	H.2.2 and H.2.3
§264.191(a)	Existing tank system w/o secondary containment	NA[a]
§264.191(b)	Written assessment of structural integrity	H.2.1, Supplement H.1
§264.191(b)(1)	Design standards	Supplement H.1
§264.191(b)(2)	Hazardous characteristics of waste	Supplement H.1
§264.191(b)(3)	Existing corrosion protection measures	Supplement H.1
§264.191(b)(4)	Documentation of tank age	Supplement H.1
§264.191(b)(5)	Results of leak test, internal inspection, or other tank integrity exam	Supplement H.1
§264.192	Design and installation of new tank systems or components	H.2.2 and H.2.3
§264.191(d)	Assessment reveals leaking	NA
§264.192(a)	Written assessment of structural integrity	Supplements H.2A, H.3, and H.4
§264.192(a)(1)	Design standards	Supplements H.2A, H.3, and H.4
§264.192(a)(2)	Hazardous characteristics of waste	Supplements H.2A, H.3, and H.4
§264.192(a)(3)(i)	Factors affecting the potential for corrosion	Supplements H.2A, H.3, and H.4
§264.192(a)(3)(ii)	Corrosion protection measures	Supplements H.2A, H.3, and H.4
§264.192(a)(4)	Determination of protection measures for underground tank system components	Supplements H.2A, H.3, and H.4
§264.192(a)(5)	Design considerations	H.1.2 and H.1.3
§264.192(b)	Precautions to prevent damage during installation	H.2.2 and H.2.3 Supplement H.2C
§264.192(c)	Backfill requirements	NA

See footnotes at end of table.

Table H-2 (continued)
Tank System Regulatory References and Corresponding Permit Application Location

Regulatory Citation(s)	Description of Requirement	Location in this Permit Application
§264.192(d)	Tightness testing	H.2.2 and H.2.3 Supplement H.2B
§264.192(e)	Protection of ancillary equipment	H.1, Supplement H.2A and H.3
§264.192(f)	Independent corrosion expert recommendations	NA
§264.192(g)	Certification of proper design and installation	H.2, Supplement H.2C
§270.16(g)	Secondary containment systems	H.3
§264.193	Containment and detection of releases	H.3
§264.193(a)	Preventing the release of hazardous constituents to the environment	H.3
§264.193(a)(1)	Secondary containment of new tank systems	H.3
§264.193(a)(2)	Tank systems used to store or treat EPA Hazardous Waste Nos. F020, F021, F022, F023, F026, and F027, within two years after January 12, 1987	NA
§264.193(a)(3)	Existing tank systems of known and documented age, within two years after January 12, 1987 or when the tank system has reached 15 years of age	H.3
§264.193(a)(4)	Existing tank systems for which the age cannot be documented, within eight years of January 12, 1987	NA
§264.193(b)	Secondary containment system requirements	H.3
§264.193(b)(1)	Design, installation, and operation to prevent migration of waste or accumulated liquid out of system to the environment	H.3
§264.193(b)(2)	Detection and collection of releases and accumulated liquids	H.3
§264.193©	Secondary containment construction requirements	H.3
§264.193©(1)	Compatible construction materials of sufficient strength and thickness	H.3
§264.193©(2)	Foundation	H.1
§264.193©(3)	Leak detection system	H.3
§264.193©(4)	Sloped or designed to remove liquids from leaks, spills, or precipitation	H.3
§264.193(d)	Secondary containment devices	H.3
§264.193(e)	Additional construction requirements	H.3
§264.193(e)(1)	External liner	H.3
§264.193(e)(2)	Vault systems	NA
§264.193(e)(3)	Double-walled tanks	NA
§264.193(f)	Ancillary equipment	H.3
§270.16(h)	Tank systems with a variance	NA
§264.193(g)	Variance from the requirements of §264.193	NA
§264.193(h)	Secondary containment variance request procedures	NA

See footnotes at end of table.

Table H-2 (continued)
Tank System Regulatory References and Corresponding Permit Application Location

Regulatory Citation(s)	Description of Requirement	Location in this Permit Application
§264.193(i)	Requirements pending provision of adequate secondary containment	NA
§264.194	General operating requirements	H.1, H.3
§264.194(a)	Prohibition of hazardous waste that could cause the tank or equipment to rupture, leak, corrode, or otherwise fail	H.1, Supplements H.1, H.2A and H.3
§270.16(i)	Description of controls and practices to prevent spills and overflows	H.1
§264.194(b)	Controls and practices to prevent spills and overflows	H.1
§264.194(b)(1)	Spill prevention controls	H.1
§264.194(b)(2)	Overfill prevention controls	H.1
§264.194(b)(3)	Maintenance of sufficient freeboard	NA
§264.195	Inspections	Attachment C[a]
§264.195(a)	Overfill control inspection schedule	Attachment C[a]
§264.195(b)	Inspection of tank system for corrosion or releases, data from monitoring and leak detection equipment, construction materials, and immediately surrounding area	Attachment C[a]
§264.195(c)	Inspection of cathodic protection system	NA
§264.196	Response to leaks or spills and disposition of leaking or unfit-for-use tank systems	H.3
§264.197	Closure and post-closure care	Attachment F.2
§264.197(a)	Removal and decontamination of all hazardous waste residues, contaminated containment system components (liners, etc.), contaminated soils, and structures and equipment	Attachment F.2
§264.197(b)	Demonstration that not all contaminated soils can be practicably removed or decontaminated	Attachment F.2
§264.197(c)	Tank system not having secondary containment that meets the requirements of §264.193(b) through (f) and has not been granted a variance from the secondary containment requirements	NA
§264.197(c)(1)	Plan for complying with removal and decontamination requirements	Attachment F.2
§264.197(c)(2)	A contingent post-closure plan	Attachment F.2
§264.197(c)(3)	Cost estimates calculated for closure and post-closure care	Attachment F.2
§264.197(c)(4)	Financial assurance based on cost estimates	Attachment F.2
§264.197(c)(5)	Contingent closure and post-closure plans must meet all of the closure, post-closure, and financial responsibility requirements for landfills	Attachment F.2
§270.16(j)	Special requirements for ignitable, reactive, or incompatible wastes	H.4
§264.198	Special requirements for ignitable or reactive wastes.	H.4

Regulatory Citation(s)	Description of Requirement	Location in this Permit Application

See footnotes at end of table.

Table H-2 (continued)
Tank System Regulatory References and Corresponding Permit Application Location

Regulatory Citation(s)	Description of Requirement	Location in this Permit Application
§264.198(a)	Circumstances allowing ignitable or reactive waste in tanks	NA
§264.198(a)(1)	The waste is treated, rendered, or mixed before or immediately after placement in the tank system	NA
§264.198(a)(1)(I)	The resulting waste, mixture, or dissolved material no longer meets the definition of ignitable or reactive waste	NA
§264.198(a)(1)(ii)	Compliance with §264.17(b)	NA
§264.198(a)(2)	The waste is stored or treated in such a way that it is protected from any material or conditions that may cause the waste to ignite or react	H.4
§264.198(a)(3)	The tank system is used solely for emergencies	NA
§264.198(b)	Compliance with the requirements for the maintenance of protective distances between the waste management area and any public ways, streets, alleys, or an adjoining property line	H.4[a]
§264.199	Special requirements for incompatible wastes	H.4[a]
§264.199(a)	Incompatible wastes, or incompatible wastes and materials, must not be placed in the same tank system, unless §264.17(b) is complied with	H.4[a]
§264.199(b)	Hazardous waste must not be placed in a tank system that has not been decontaminated and that previously held an incompatible waste or material, unless §264.17(b) is complied with	H.4[a]
§270.16(k)	Air emission control equipment	H.6
§270.27	Information requirements for air emission controls	H.6
§264.200	Air emission standards	H.5, H.6

[a] Requirement or information is also addressed in the most recent version of the "Los Alamos National Laboratory General Part B Permit Application."

NA = not applicable.
EPA = U.S. Environmental Protection Agency

Table H-3
Secondary Containment Capacities for the Storage Tank System

Storage Tank System Component	No. of Tanks	Tank Capacity (gallons)	Location	Secondary Containment	Capacity of Secondary Containment (gallons)
Evaporator Glovebox Tank	1	71	TA-55-4, Room 401	TA-55-4, Room 401	10,773[b]
Cementation Unit Pencil Tanks	5	13			
Pencil Tanks	10	13			

a The tank capacity listed is for each individual tank associated with the component.
b Secondary containment capacity based on Room 401, which is recessed 2.5 inches and has dimensions of 60-ft-long by 75-ft-wide

TA = technical area